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RECYCLING IN CONJUNCTION WITH WASTE-TO-ENERGY FACILITIES - PART TWO

Part One of "Recycling in Conjunction with Waste-to-Energy Facilities" (Garbage Gazette, Vol. 4, No. 1) discussed the importance of recycling in conjunction with energy recovery in order to:

1. reduce the amount of ash/residue and bypass that must be landfilled;
2. lower tipping fees;
3. lower transportation costs;
4. reduce maintenance costs;
5. improve fuel value through the removal of non-combustibles, such as glass and metals.

This issue will address the more controversial topic of the removal of paper from the waste stream for recycling.

The essence of the controversy can be described as a debate over whether paper is more valuable as a commodity to be burned for its energy value than as a commodity to be sold for its fiber value. This question has come under sharp nationwide debate already in the form of flow control ordinances, which attempt to control the content of a municipal wastestream in order to support an energy facility. Debate over flow control ordinances and how they will affect current as well as future waste paper recycling programs is already intense, and is likely to intensify as more plants come on line.

According to the American Paper Institute (API), the national trade association representing over two hundred manufacturers of pulp, paper and paperboard, nearly 25% of the paper used in this country last year was recycled for its fiber value. API is concerned with the impact waste-to-energy facilities will have on that portion of waste paper that is currently recycled, as well as with the impact on related industries and dependent organizations, such as domestic paper mills, export markets, and charitable organizations, to name just a few.

But what are the basic economics of fiber vs. fuel? According to Jim Dohrman, Solid Waste Engineer for Dufresne-Henry in Springfield, Vermont, the fuel value of paper in the wastestream is estimated to be between $50 and $60/ton. (This estimate assumes a conservative energy content of 6500 Btu/lb., or 13 million Btu per ton of paper. Compared to No. 6 fuel oil at 150,000 Btu/gal., a ton of paper is equivalent to 87 gallons of oil. The $50-$60/ton estimate allows for the differing thermal efficiencies between oil burners and energy recovery facilities.*)

As any local "small" recycler will confirm, this far exceeds any price he or she can hope to negotiate for their recovered newspaper or corrugated. In fact, the only grades of paper which can compete with that figure and can be recovered on a small scale and in loose form are the three high-grades: computer tab cards, computer printout and white bond office papers. These papers are most often generated in office facilities, however, and are not usually part of a municipal recycling program. But there are additional economic considerations for a municipality. For instance, a ton of waste paper may be worth $50-$60/ton to an energy recovery facility, but a municipality must pay to transport that ton of paper to the facility and pay a tipping fee for its processing. Tipping fees may be negotiated to reflect the total energy value of the municipal wastestream, but a municipality always will pay transportation and processing costs regardless of the wastestream's energy value. Therefore, even at $15 - $20/ton for the lower grades of paper, there can be favorable economics for a municipality when those revenues are balanced againsttransportation and tipping fees.

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*Out of the Dumps. Association of Vermont Recyclers. "Recycling Vs. Resource Recovery" Jim Dohrman. Vol. II, No. 3, pp. 10.

Furthermore, the lower grades such as corrugated and newspaper can compete dollar for dollar with paper's energy value if the paper is prepared into high-density mill-sized bales suitable for shipment overseas or to a domestic paper mill. These bales can weigh approximately 2200 lbs. and can command $50/bale. How does the "small" local recycler enter that sort of market? The answer lies with cooperative regionalized recycling programs, which is a topic later issues of the *Gazette* will address. The point is that the value of paper as a fiber can compete economically with its value as a fuel if it is collected in sufficient quantities and prepared for market properly.

Does this mean that *all* paper should be recovered for its fiber value? Absolutely not. According to *Source Separation & Recycling: A Connecticut Guide,* published jointly in 1981 by the Department of Environmental Protection and the Energy Division of the Office of Policy and Management, approximately 33% (by weight) of Connecticut's solid waste stream consists of paper and paper products. The specific breakdown is as follows:

Newspaper	6.5
Books, Magazines	2.3
Office Paper	3.8
Tissue paper, paper towels	1.6
Paper plates, cups	.4
Other nonpackaging paper	.8
Corrugated	9.2
Other paperboard	4.0
Paper packaging	3.8

As is evidenced by this breakdown, a portion of those papers such as tissues, paper plates, towels, packaging, etc., could never hope to be recovered, so their presence in the wastestream as a source of energy is guaranteed. Where those papers that stand a far better chance of being recovered are concerned, such as newspaper, office paper and corrugated, it is important to remember that a recycling program will never achieve 100% recovery, both because 100% participation cannot be reached, and because some of the papers will be contaminated in such a way as to make them undesirable for recycling. So a percentage of even these papers will always remain in the wastestream, despite the efforts of recycling programs designed to keep them out.

A study performed by Gershman, Brickner & Bratton entitled *The Compatibility of Newspaper Recycling and Energy Recovery*, published in 1980, estimates that if a newspaper recycling program achieves a 25% participation rate, it would lower the energy value of the remaining solid waste by only 2.8%. That same study estimates that the demand for newsprint alone in this country will increase by 51% between 1977 and 1999, to a total of 15.6 million tons. In the face of such increased consumption, protecting a portion of our waste paper for its fiber value takes on new importance.

One last point for consideration: a number of important studies conclude that the burning of paper is *not* its optimal energy use. These studies argue that the recycling of paper is already energy efficient because making paper from recycled fiber uses 60% less energy during the manufacturing process than paper made from virgin fiber. It is widely believed by many that this is where paper's true intrinsic energy value lies.

For further reading on the subject see:

Gilbert Associates, Inc. "Compatibility of Source Separation and Mixed-Waste Processing for Resource Recovery" U.S. EPA, Washington, D.C., 1980. (Draft)

Love, P. "Should Wastepaper be Recycled for Its Fiber or Fuel Value?" In: Net Energy Savings from Solid Waste Management Options. Environment Canada, Ottawa, 1976.

Gunn, T.C. "The Energy Optimal Use of Wastepaper." U.S. Department of Energy, Washington, D.C., November 1978.

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